

measured method differs from the two other methods.

## 4. Conclusion

The questions stated at the beginning are answered by performed experiments as follows:

*Are the results affected by the composition of the stock solution, by the way of its addition and by the sample preparation procedure?*

The Cu-trien method is sensitive to the stock solution preparation and to addition of the stock solution. In the case of charge-reduction or other sample treatment (in order to change its properties), use one solution and one addition is highly advised. Filtration was found to be

faster procedure of sample preparation with a small influence on  $CEC_{Cu}$  and  $CEC_{uv-vis}$ .

*Does the type of the interlayer cation influence the results?*

Concerning  $CEC_{Cu}$  and  $CEC_{uv-vis}$  there were no differences found in relation to the type of homoionic form (DR samples). The interlayer cation influenced  $CEC_{Cu}$  and  $CEC_{uv-vis}$  in the same manner confirming the interchangeability of the methods. The results of  $CEC_{Cu}$  and  $CEC_{uv-vis}$  were increased due to the interlayer cation in the  $Ca^{2+} < Mg^{2+} < Na^{+} < Li^{+}$  order. The  $CEC_M$  differed significantly due to inhomogeneous extend of ionic replacement in the interlayer space.

Investigation of the homoionic form revealed an influence of sample preparation on monovalent cations ( $Na^{+}$  and  $Li^{+}$ ) using  $CEC_{uv-vis}$  and  $CEC_{Mg}$  (AAS).

*What is the reliability of the Cu-trien method when using atomic absorption/ emission spectroscopy and how much the result differ from colorimetry?*

The comparison of the method within the reference samples (STx-1 and SWy-2) was unclear. Observation of AAS/AES and UV-Vis results on homoionic samples (DR) revealed that there is no statistical difference comparing the methods.

*How much the results differ from those obtained by the classical  $\text{NH}_4^+ \text{HAc}$  method?*

The Cu-trien method was compared with the ammonium acetate and the silver thiourea methods using collected clays. There was no significant difference found concerning ammonium acetate method. Taking in account the time consumption, the Cu-trien method is incomparably faster. The silver thiourea method was found to be significantly different from the two remaining methods. The most probable source of error lies in the application of this method to bentonitic samples.

Summarizing all the above conclusions, the cation exchange capacity determined using the Cu-trien complex is not robust. Application of this method requires the same experimental settings within the set of the similar samples. Cu-trien method is fast and results are in good agreement with standard ammonium acetate method.